

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Sun-Uk Kim et al.                      Art Unit : 1791  
Serial No. : 10/560,023                              Examiner : Erin Lynn Snelting  
Filed : December 8, 2005                              Conf. No. : 1005  
Title : Method For Fabricating A Porous Silica Sphere

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION OF SUN-UK KIM UNDER 37 C.F.R. § 1.132**

I, Sun-Uk Kim, hereby declare that:

1. I received a Ph.D in Ceramics from Alfred University in 1986, and I held a Post Doctoral position with Alfred University from 1986 to 1987. I have been a research scientist at the RIST (Research Institute of Industrial Science & Technology) in Korea since 1987. During the meantime I was a visiting researcher at the MRL (Materials Research Laboratory) in the Penn State University.

2. I consider myself an expert in the field of ceramic processing, especially sol-gel processing method, glass since my Ph.D. thesis was on the sol-gel processing of silica - titania system and my M.S thesis on the ion-exchange mechanism of alumino-silicate glasses.

3. I am an inventor of the subject matter described and claimed in the above-identified application.

4. I understand that an Office Action dated February 26, 2009 is outstanding in the present application, in which claims 1, 2, 4, 6, and 7-9 are pending and under examination. I also understand that claims 1 and 6, the only independent claims among them, each cover a method for fabricating a porous silica sphere.

5. As shown below, I or others performed the following two experiments which show that the methods of claims 1 and 6 exhibit unexpectedly superior features when compared to the methods described in the cited references:

**I. Silica gel prepared using a non-rotary furnace during heat treatment and a temperature increase speed of 1°C/minute to 2°C/minute.**

Silica gel was obtained using the following procedure: Silica gel particles having a size over 10 mesh were heated at the temperature of 1100 °C at a rate of 120 °C per hour up to 1100 °C in the non-rotary furnace. The temperature of 1100 °C was maintained for one hour and then cooled down to the room temperature.



Figure 1. Visible failure of silica gel to properly foam to form spheres due to usage of a non-rotary furnace.

Figure 1 shows silica gel thus prepared. As can be seen in Figure 1, without the use of a rotary furnace, it is very difficult to transfer heat into the silica gel due to the adiabatic effect of already foamed silica gel spheres, which insulate the interior silica gel from reaching the appropriate temperature. As such, the interior silica gel failed to foam.

**II. Silica gel prepared using a non-rotary furnace during heat treatment and a temperature increase speed of 1°C/minute to 2°C/minute up to 1150°C with holding time of 1 hour.**

Silica gel was obtained using the following procedure as indicated above.

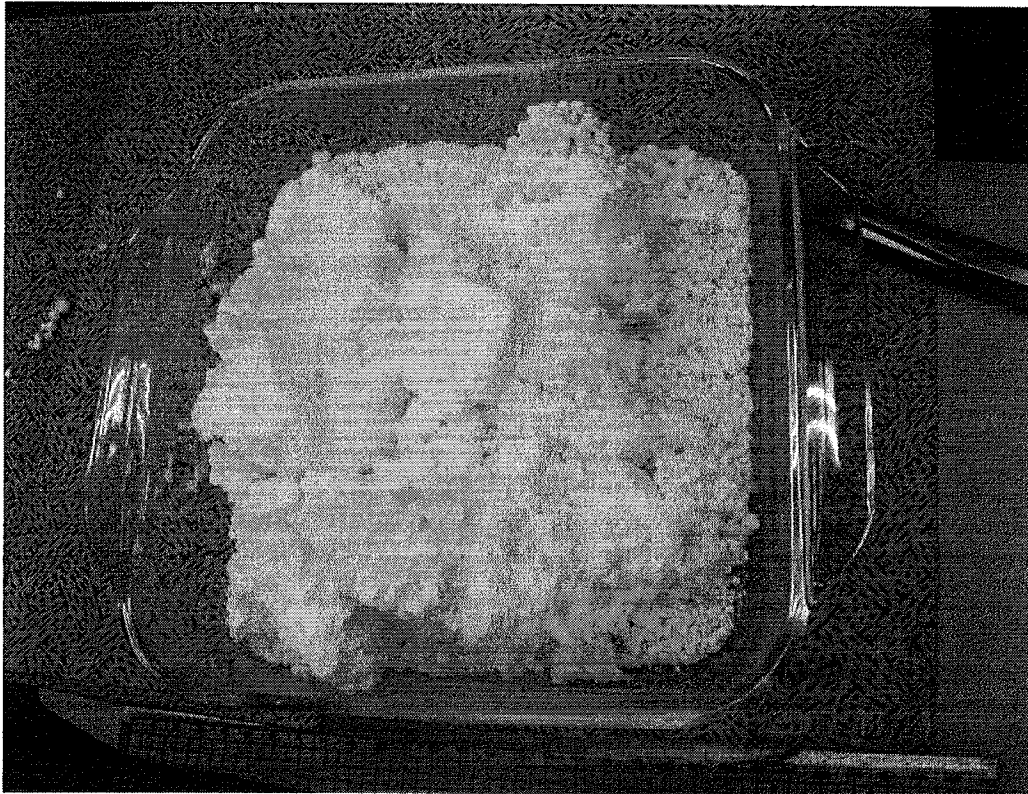


Figure 2. Visible clumping of silica gel using a temperature increasing speed of 2°C/min

Figure 2 shows silica gel thus prepared. As can be seen from this figure, after heat-treating silica gel using a temperature increase of 2°C/min, part of the silica gel was over-foamed and clumped together after heat treatment at 1150°C which was higher temperature than that of Figure 1.

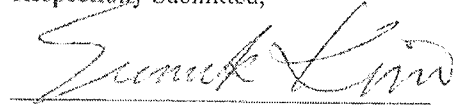
6. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of

Attorney Docket No.: 76303-003US1  
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the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 25 June 2009

Respectfully-Submitted,



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dong, Nam-ku, Pohang-city,  
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